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"Girth monitor".

*I, Wendy Charmaine Barker, of 24 Western Springs Road, Mt Albert,
Auckland, a citizen of New Zealand, do hereby declare this invention
to be described in the following statement:*

FOUNDED BY THE NEW ZEALAND PATENT OFFICE
IN THE YEAR 1953
1953-1954

TITLE *Girth monitor*

FIELD

This invention relates to an article to be worn by a person; placed around the person's waist, and the invention relates to the fields of human body weight monitoring and to personal health and fitness.

BACKGROUND

Many people especially in the Western world have a tendency to add excess weight to their bodies with consequences for example of unsightliness, reduced exercise tolerance, and poorer health. Of course attitudes of society may be somewhat distorted towards the excessively thin, at least in some circles such as fashion models. There are said to be millions of people suffering from overweight or obesity. Weight management, such as maintenance of a desired weight, or reduction of an excessive weight is perceived as an important part of personal health management. Many people enter weight management programmes including diets and exercise. Weight management is an important aspect of life for a mother of a new baby.

While an obvious way to monitor weight is though the use of weighing scales, it has been noted that minor fluctuations such as in "on-board food or drink" can affect a measurement. Furthermore the measurement equipment is non-transportable so that the "damage of a large dinner" could be inflicted well before the person has an indication of said damage. Waist circumference can be a more instantaneous, steady and reliable indication of changes in body weight reflecting synthesis or breakdown of body fat.

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30 indication of said damage. Waist circumference can be a more instantaneous, steady
and reliable indication of changes in body weight reflecting synthesis or breakdown
of body fat.

Some high-technology approaches to monitoring waist circumference include Pollack
et al US 5666104 (published Sept 1997) which essentially comprises a belt with a
35 built-in battery-powered electric alarm which sounds as soon as the wearer eats too
much and thereby applies a tension to the belt which exceeds a preset amount.
There is an alarm delay mechanism included. Chaillou US 4871998 (published Oct
1989)(see Fig 1), and Roldan US 5304984 (published Apr 1984) both describe a very
similar device, though Roldan's device cuts off personal stereo music if the belt
40 tightens; a particularly cruel measure.

These devices have disadvantages including that they are rather large, ugly, incom-
patible with becoming wet (so must be taken off before bathing or swimming, or
going out in the rain), and could be highly embarrassing to the wearer when out to a
meal. Salmasian in US 4592342 describes a non-active belt device for effecting weight
45 loss, but this one operates by pressing into the wearer's abdomen so that the ability
of the stomach to hold large amounts of food is reduced.

Waist belts or waist chains are known in the decorative jewellery area. Although
some of these could be used as substitutes for the instant invention, they are little
better suited than a piece of string. Many are intended to be worn outside clothing.
50 None of these have been adapted to act as a girth monitor.

OBJECT

It is an object of this invention to provide an improved and acceptable girth monitor
for body weight control, or at least to provide the public with a useful choice.

STATEMENT OF INVENTION

55 In a first broad aspect this invention provides a girth monitor, for use by a person for
tracking one's weight (body composition) and providing the person with both
immediate and long-term feedback as to weight reduction or posture control,
wherein the girth monitor comprises a substantially inextensible, flexible cord ("cord"
being used in its widest sense) provided at a first end with means for reversible yet
60 firm attachment of the first end onto a selected point at or near to the second end of
the cord, thereby being capable in use of forming an adjustable closed loop about the
waist of a person; the girth monitor being adapted to be worn in contact with the
person's body for extended periods of time, and being capable in use of serving, by
means of a variation of a perceived pressure under the girth monitor, to immediately
65 indicate to that person any alterations (or trends) in waist circumference thus
providing operant conditioning feedback.

Preferably the detailed construction (selection of materials, shape, configuration, and
proportions) of the girth monitor are specifically made to be attractive or at least
acceptable to at least the wearing person, so that the girth monitor will tend to be
70 used over a longer period.

In a first related aspect, the girth monitor comprises a light chain made of links of a
rigid material and the means for reversible attachment of the first end of the light
chain comprises a catch means capable of being passed through a selected link of the
chain, so that the loop formed around the person's waist can be opened from time to
75 time and so that the circumference of the loop can be incrementally altered.

Preferably the light chain is made of links of metal; preferably one not likely to
exhibit corrosion or cause a reaction against a person's skin.

More preferably the metal is substantially comprised of silver alloyed with an
effective amount of at least a second metal; preferably in order to render the silver
80 harder.

In a second related aspect, the light chain is made of a plurality of small links regularly interspersed with a lesser plurality of larger links; the larger links being capable of serving as "major-step" measuring points in addition to serving a decorative function, so that the girth monitor is capable of serving as an aid in a weight management programme; whether the programme is formal or not.

In a third related aspect the larger links are provided with indicia capable of defining an actual length of the girth monitor as taken from the catch means or measuring points in addition to a decorative function. and so that the cord serves as an aid to a weight management programme; whether the programme is formal or not.

90 Alternatively, the girth monitor is partially or completely comprised of a non-metallic material.

In a second broad aspect this invention provides an adjustable but otherwise inextensible flexible cord capable in use of forming a close-fitting, closed loop about the waist of a person, adapted to be worn in contact with the person's body for extended periods of time, and capable in use of serving to indicate to that person any alterations in waist circumference and so that the cord serves as an aid to a weight management programme Preferably the cord is decorative, so that it is acceptable to the person wearing the cord (and to associated persons) and is hence unlikely to be rejected.

100 Preferably the cord is long-lasting.

Preferably the cord is made of a metal chain.

More preferably the chain is made of soldered silver links, having at or near a first end a reversible fastener capable of being attached to any link at or near a second end.

105 Optionally the inextensible flexible cord may be made of a non-metallic material, preferably leather or one or more of the plastics.

In a third broad aspect, the invention provides a method for monitoring the body composition of a person by means of a girth monitor as previously described in this section, wherein (a) the girth monitor is worn constantly, (b) a perceptible loosening
110 of the girth monitor provides instant feedback of a loss of weight by the person; alternatively a perceptible tightening of the girth monitor provides instant feedback of a gain of weight by the person, and (c) the length of the inextensible belt may be adjusted when a change in weight appears to have become stabilised so that the range of circumferences of personal girth which may be monitored is thereby
115 increased.

In a related aspect the invention provides an opportunity, on making an incremental change in circumference of the girth monitor, to stage an event with a ceremony thus providing further operant conditioning capable of rewarding the person for having caused their change in girth.

120 PREFERRED EMBODIMENT

The description(s) of examples of the invention to be provided herein is/are given purely by way of example and are not to be taken in any way as limiting the scope or extent of the invention.

DRAWINGS

125 Fig 1: is a typical example of the prior art (posture/girth monitor of Chaillou US 4871998)

Fig 2: is an example of the invention.

Fig 3: shows detail of the adjustment process.

In the prior art figure, a posture monitor emits an alarm noise from buzzer unit 34
130 whenever the tension in the belt 12 exceeds a predetermined limit. Adjustment means are provided at the "Velcro" (TM) area 21.

The present invention is also a device for providing an indication of waist circumference or girth measurement (even posture as per Chaillou) but does this in a more subtle manner and without active components such as batteries switches or buzzers.

135 This invention provides an occasionally adjustable yet inextensible flexible cord to be worn under clothing and about the waist of a person concerned about their girth as a close-fitting, closed loop. In a fashion analogous to that of a "go/no go" engineering workshop test device, the invention simply indicates (by feeling tighter or looser) whether the person's girth is "about right", "a bit larger", or "a bit smaller" in relation

140 to a current setting. It is indicating a trend. The initial setting is usually determined as lightly enclosing suiting the person's waist either at the start of a weight control programme, or simply when the article is first worn. There is no particular need to enter a weight control programme; the item can be beneficial without. Indeed, the item forms its own weight control programme. A goal is to be able to continually

145 link the girth monitor at a shorter position - moving the point where the link 201 is joined, when in use, to the other end of the chain 204 at a link farther from end 205, as suggested by the arrow 301 in fig 3. If this is done, probably from week to week so that the perceived tightness of the belt is more or less constant, the wearer is provided with a girth monitor that also serves as a "fatness" or body composition

150 monitor and as a posture improver- (by acting against slouching).

In use, a person will be able to feel a developing tightness of the cord (which is preferably a light metal chain) about the waist at any time, and if a behavioural response is required, that response can be made immediately. (Imagine for example the wearer, sitting down to a meal at a restaurant. Perceptible tightening of the chain

155 is a signal that the person may not continue to eat or to order another course. There is no perceptible evidence of the girth monitor and/or of its signals to the wearer, to another person). This immediate feedback is regarded in operant conditioning (a branch of psychology) as being particularly valuable.

The chain is normally worn continuously and provides no impediment to normal

160 activity. Unlike Salmasian's belt (see "Background") there is no intention that there normally be an applied pressure. Unlike that belt, the present invention is also decorative and its presence can easily be explained as "personal jewellery" if the

wearer does not want to acknowledge a weight problem. (This renders the decorative "prior art" an advantage rather than being destructive of novelty). Hence there is no embarrassment issue (as cited in prior art documents Myers and in Salmasian). Statements from users so far indicate that partners find the girth monitor quite acceptable - and this is an important aspect of maintaining the girth monitor in use over a long period of perhaps 6 months or more.

EXAMPLE 1

The inventor prefers a light chain 200 made of (usually soldered) silver wire links 202 and 203, as in Fig 2, which is a small, hardly visible thing (unlike the prior-art belts as 100 in Fig 1) compatible with continuous wearing. Preferably the chain will not catch in clothing. The use of a spring-loaded catch 201 at a first end to engage with a selected link 204 at or near the other end provides for removal or occasional, incremental (link by link) adjustment in either direction. The larger figure-8 twists (e.g. 202) are primarily decorative although they have several functions. They act as distance indicators. It is easier to appreciate a change made relative to a nearby indicator (figure-8 twist) than if made in relation to the entire length of the chain, which might have to be taken off and perhaps placed against a yardstick. These small changes seem more significant as compared to a nearby marker, which can be encouraging to a person struggling with a girth-related problem. The twist 205 at one end is a useful grip for use when clipping or unclipping the catch 201 in order to attach the chain to one's waist (see fig 3). One example starting length for the entire chain 200 is 26 inches (550 mm). The silver wire forming each link may be about 1 mm in diameter. Each link is typically about 5 to 10 mm in length. Optionally, small and large links can alternate for a decorative effect, although it is preferable that they are all a consistent size at the end farthest from the catch. Alloys of silver with for example copper may confer usefully reduced ductility, as is well known in the art. It would not be useful if the chain could be stretched to a new length. A typical chain made of silver weighs about 35-45 grams.

Silver is inert, unlikely to stain the body or clothing, is ornamental, and is an accepted material for jewellery. Of course a chain made of other materials could be used and remain consistent with the spirit of the invention. Other precious metals tend to be very expensive, sometimes heavy, and often soft. Plated gold (for example) chain is a possibility but once the plating has worn through the underlying metal (unless it is inert, like silver) can begin to corrode and stain clothing. There may be a desire to wear (for example) copper or a copper alloy for perceived health reasons.

A plastics material, such as brightly coloured polypropylene, leather, or even a piece of string tied with a knot could be used for a similar purpose, but these materials lack the eye appeal, the longevity, and the incremental adjustability of a chain.

Usually the initial length is set to be a loose yet perceptible fit. The monitor will tighten noticeably as soon as the wearer puts on weight, so that it can warn the wearer of for example over-indulgence in food during a meal. Thus the chain serves as a subtle yet immediate reminder of the arrival of excess girth which usually means excess weight, and can form an "early-warning" part of a weight management programme that may be more "user-friendly" than one which has to rely on daily weight measurements that may be too late for an instance of over-indulgence. The wearer is of course free to ignore the message from the girth monitor according to the specific situation. It will of course be appreciated that use of the girth monitor is only loosely indicative of an actual body weight although for a given individual the working length of the girth monitor should remain in proportion to the degree of fatness.

APPLICATIONS.

Examples of applications include: (a) weight management for a post-partum mother, and (b) as a milestone indicator in a weight loss programme. In the former, it is well known that mothers are prone to retaining or putting on weight in late pregnancy and afterwards, and confirmation that some reduction is being achieved can be very important to the mental wellbeing of a mother. In this application, a chain would be worn and particularly used as a monitor primarily of weight although abdominal

muscle tone plays a part as well. In relation to weight loss programmes, where there is often a procedure for marking each step of weight loss, each time when the chain can be shortened by one link can form the centre of a ritual or ceremony to publicly confirm a certain loss of weight.

- 225 The device is best regarded as a monitor of trends rather than a device for absolute measurement. It must be remembered that body weight itself is only one measure of a person's body composition including the fat, muscle, bone, other tissues and organs, water, gut contents, and the like - and even body composition is compared against a set of desires often based for example on "good fit inside favourite clothing"
- 230 or a partner's opinion rather than on some idealised numerical specifications such as a preferred weight for a given height, which ideals themselves may be based on suspect data such as population statistics from a less-than-"perfect" population. Many people advise that the "good fit inside favourite clothing" test is to be preferred.

VARIATIONS

- 235 For certain groups, plastics materials may be acceptable alternatives to metal chains, such as chains or belts made of a brightly coloured durable substance such as a dyed acrylic or a polycarbonate.

- While this solution to the problem of monitoring weight gain and signalling an "over-eating situation" as soon as it occurs might be regarded as primarily a
- 240 "woman's thing" it is in fact even more suitable for use by men because the distribution of fat in men tends to be more localised in the abdomen whereas women tend to put on fat more evenly all over the body. Nevertheless the design or style of the actual girth monitor may be modified so that it appeals more directly to men.

COMMERCIAL BENEFITS or ADVANTAGES

- 245 The invention is expected to make a substantial improvement to the effectiveness of weight reduction programmes, especially when used by women. The usual approach to weight management is to carry out periodic weight measurements on a spring balance or the like. This is very much delayed from potentially weight-raising events.

The selection of a precious-metal chain as the inextensible yet occasionally adjustable
250 cord has the advantage that the invention can be regarded as an item of personal
jewellery as well as an item having a specific purpose, and is hence more likely to
remain in place for an extended period. Further, the non-trivial expense implies and
leads to a serious commitment on the part of the buyer.

Occasional adjustment can be carried out by the user as required, for which action
255 incremental settings are inherently provided by the use of a catch capable of
engaging with any links of a chain.

The chain can be worn continuously and invisibly, and its message is made known
only to the wearer. It needs no batteries for its function. It is continuously active
(some prior art includes on/off switches).

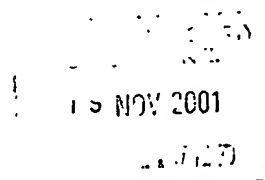
260 The warning of excess girth provided to the wearer by the invention is immediate
and quiet (i.e. personal) and immediate feedback of over-eating is given.

Finally, it will be understood that the scope of this invention as described and/or
illustrated within this provisional specification is not limited to the preferred embodi-
ments described herein for illustrative purposes. Those skilled in the art will appre-
265 ciate that various modifications, additions, and substitutions are possible without
departing from the scope and spirit of the invention as set forth in the following
claims.

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I CLAIM:

1. A girth monitor, for use by a person of either gender for tracking one's weight (body composition) and providing the person with both immediate and long-term feedback as to weight reduction, *wherein* the girth monitor comprises a light chain made of links of a rigid material; the chain being provided at a first end with means for reversible though positive attachment of the first end onto a selected one of a plurality of links along the chain, thereby being capable in use of forming an adjustable closed loop about the waist of a person; the girth monitor being adapted to be worn in contact with the person's body for extended periods of time, and being capable in use of serving, by means of a variation of a perceived pressure under the girth monitor, to immediately indicate to that person any alterations in waist circumference and providing operant conditioning feedback.
2. A girth monitor as claimed in claim 1, *wherein* the means for reversible attachment of the first end of the light chain comprises an openable catch capable of being passed through a selected link of the chain, so that the loop formed around the person's waist can be opened from time to time and so that the circumference of the loop can be incrementally altered.
3. A girth monitor as claimed in claim 1, *wherein* the materials from which the chain is made, and the appearance of the girth monitor are made to be acceptable to at least the wearing person, so that the girth monitor will tend to be used over a longer period.
4. A girth monitor as claimed in claim 3, *wherein* the light chain is made of links of metal.
5. A girth monitor as claimed in claim 3, *wherein* the metal is substantially comprised of silver alloyed with an effective amount of at least a second metal.



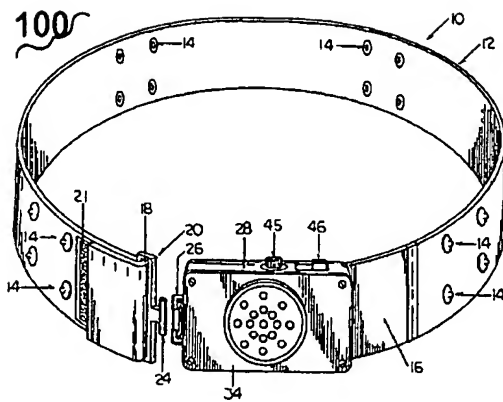
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6. A girth monitor as claimed in claim 2 or in claim 3, *wherein* the light chain is made of a plurality of small links regularly interspersed with a lesser plurality of larger links; the larger links being capable of serving as measuring points in addition to serving a decorative function, so that the girth monitor is capable of serving as an aid in a weight management programme.
7. A girth monitor as claimed in claim 6, *wherein* the larger links are provided with indicia capable of defining an actual length of the girth monitor as taken from the openable catch; each indicium serving as a measuring point in addition to having a decorative function, so that the girth monitor is capable of serving as an aid in a weight management programme.
8. A girth monitor as claimed in any previous claim except claim 4 or claim 5, *wherein* the girth monitor is comprised of a non-metallic material.
9. A method for monitoring trends in the body composition of a person by means of a girth monitor as claimed in any previous claim, *wherein* (a) the girth monitor is worn over an extended period, (b) a perceptible change in tightness of the girth monitor provides instant feedback of a change of weight by the person, and (c) the length of the inextensible chain may be adjusted incrementally once a change in weight appears to have become stabilised so that the range of circumferences of personal girth which may be monitored is thereby increased.
10. A method as claimed in claim 9, *wherein* an event of making an incremental change in circumference of the girth monitor is capable of being recognised with a ceremony thus providing further operant conditioning capable of rewarding the person for having caused their change in girth.

Ensor and Associates, for



Wendy Charmaine Barker.



PRIOR ART
Fig 1

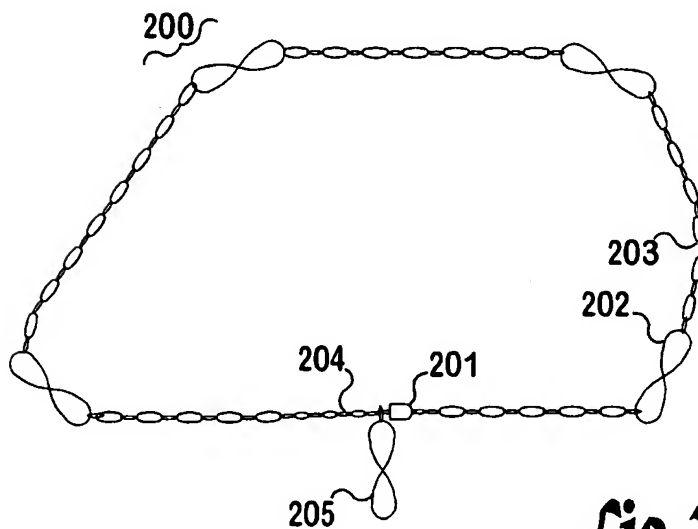


Fig 2

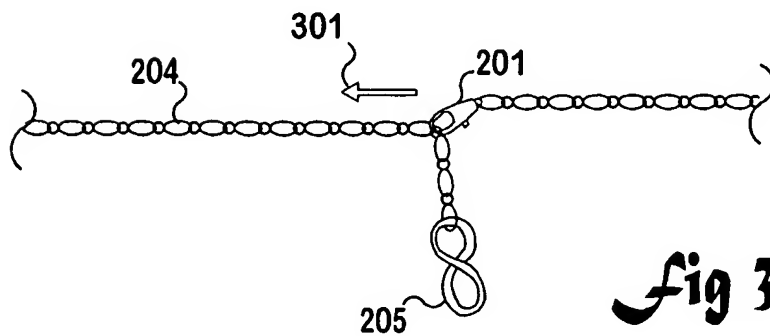


Fig 3